

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF WARREN COUNTY	)	
WATER DISTRICT, WARREN COUNTY,	)	
KENTUCKY, (A) FOR A CERTIFICATE OF	)	
CONVENIENCE AND NECESSITY, PURSUANT	)	
TO KRS 278.020, AUTHORIZING SAID	)	
DISTRICT TO CONSTRUCT IMPROVEMENTS	)	CASE NO. 9606
AND EXTENSIONS TO ITS EXISTING WATER	)	
DISTRIBUTION SYSTEM, AND (B) FOR	)	
AUTHORITY TO ISSUE CERTAIN SECURI-	)	
TIES AS REQUIRED BY KRS 278.300	)	

O R D E R

IT IS ORDERED that Warren County Water District ("Warren") shall file an original and seven copies of the following information with the Commission with a copy to all parties of record within 3 weeks of the date of this Order. If the information requested or a motion for an extension of time is not filed by the stated date, the Commission may dismiss the case without prejudice.

1. In order to obtain realistic results when utilizing computer hydraulic analyses to predict a water distribution system's performance, engineering references stress the importance of calibrating the results predicted to actual hydraulic conditions. This calibration process should include matching field measurements to the results predicted by the computer over a wide range of actual operating conditions. As a minimum this

should include average and maximum water consumption periods, as well as "fire flow" or very high demand periods.

Information filed earlier in this case briefly outlines the procedures used to verify the computer hydraulic analyses filed in this case. However, no mention of calibration to "fire flow" or very high demand periods is mentioned. If the model was not calibrated to these conditions state why not. Also state what level of confidence can be placed in the present model without this calibration.

2. The computer hydraulic analyses filed in this case are based on "average," "peak" and "slack" demand periods. The "average" demand is supposedly a 24-hour average usage; the "peak" demand ranges from 2 to 2.5 times the "average" demand; and the "slack" demand is .21 times the "average" demand.

Most engineering references state that instantaneous customer demands can peak at 3 to 15 times the 24-hour average demand. In addition, most engineering references also state that a water distribution system should be designed to meet the maximum hourly demand of its customers.

Base on the above information provide a detailed explanation of why Warren's peak demands do not conform to generally recognized customer usage patterns. The explanation should be documented by actual field measurements. State how the coincidental demands utilized in the computer hydraulic analyses were determined. General engineering references indicate that the coincidental peak demand per customer increases as the number of

customers decreases. State if the difference between the coincidental demands which occur on transmission and large main water lines and the coincidental demands which occur on small diameter deadend water lines was considered in the hydraulic analysis. If not, state why not. Also state exactly what measurements were made of Warren's maximum hourly usage. If the maximum hourly usage was not measured directly, state why it was not.

3. The computer hydraulic analyses filed in this case for the proposed water distribution system indicate that the potential exists for the existing and proposed systems to experience high pressure (more than 150 psig) at Nodes 9, 37, 63, 64, 80, 82, 83, 340, 343, 345, 355, 357, 359, 418, 505, 517, 551, 709, 801, 836 and 894. Pressures at this level are in violation of 807 KAR 5:066, Section 6(1). Provide details of any preventive measures or additional construction Warren intends to perform to protect against this type of occurrence. Details should be documented by hydraulic analyses and field measurements.

4. The hydraulic information filed in this case indicates that very little fluctuation occurs in the water level in Warren's water storage tanks (i.e. Tanks are either full or several feet below overflow). Please explain the rationale behind this type of operation.

5. The hydraulic information filed in this case also indicates that several of Warren's pumps operate at or near the right end of their respective pump curves. This type of operation

is generally inefficient and may lead to "cavitation" or other operating problems. State whether this type of operation actually occurs and, if it does, state what preventive measures or additional construction Warren intends to perform to protect against this type of occurrence.

Done at Frankfort, Kentucky, this 18th day of July, 1986.

PUBLIC SERVICE COMMISSION

Richard D. Hermann  
For the Commission

ATTEST:

Forrest M. Skiff  
Executive Director